



What is Android?

Android Operating System

- ▶ First released in 2008 with 1.5 (Cupcake – API level 3)
- ▶ Current release is 9.0 as of August 2018 (Pie – API level 28)
- ▶ Intended to be a platform written for developers by developers

Android Development Environment

- ▶ Originally released as an Android ADK (Application Development Kit) plugin for the Eclipse Studio IDE
- ▶ Was migrated to IntelliJ in 2013
- ▶ Current IDE is now Android Studio version 3.1.4
- ▶ Implemented to take advantage of the Gradle dependency management system

Android Runtime (ART)

- ▶ Android Runtime (ART) is an application runtime environment
 - ▶ Replaced the original Dalvik runtime in Android 5.0 “Lollipop”
- ▶ Unlike Java’s just-in-time (JIT) compiling, ART compiles ahead of time
- ▶ This makes it faster, and improves memory management

Why ART?

- ▶ It exists as an abstraction layer to hide the internal complexities of the Android Framework
- ▶ It allows for safe exposure of the features, which allows for rich application development
- ▶ It provides access to the hardware of the mobile device, but in a way that is intuitive to developers and prevents unsafe operations
- ▶ These functions are exposed through the Android API

Android API

- ▶ An API is an “Application Programmable Interface”
- ▶ APIs are the interface that allow for regulated and considered access to the features that a framework, library, or remote data source agree to expose to the programmer
- ▶ Think of it like a car. The inner workings are hidden from view, but an interface is supplied for its function
- ▶ EXAMPLE
 - ▶ `locationManager.getLastKnownLocation(LocationManager.GPS_PROVIDER);`
 - ▶ This single line of code obfuscates complex functionality. Under the hood, it executes a search for available orbiting GPS satellites and the communicates with them to get your device's latitude and longitude

Android Studio

- ▶ Android Studio is an Integrated Development Environment (IDE)
- ▶ It provides everything that you need to develop and test your Android application in a single, robust program
- ▶ Android Studio relies on the Java Development Kit (JDK), which provides tools for writing code in Java
- ▶ The Android Software Development Kit (SDK) is used by Android Studio to provide access to the Android API

Android Apps



What comprises an Android App?

- ▶ Java
 - ▶ Android also supports Kotlin, a relatively new language from JetBrains
- ▶ The Android Runtime executable
- ▶ Android Resources

Android Resources

- ▶ Images
- ▶ Sounds
- ▶ XML layout files
- ▶ XML resource files
 - ▶ strings
 - ▶ vector coordinates
 - ▶ numerical values

Android Packages

- ▶ Android apps are organized into “packages”
- ▶ A Package is essentially the library or framework that you have coded to make an app a reality
- ▶ Packages often have sub-packages, also known as libraries
- ▶ Libraries are most commonly used to include code that was written to accomplish a common task and encapsulated in an Android package for reuse in many apps.
 - ▶ Retrofit, RxJava, and Dagger are commonly used Android libraries